

Exhibit E

Aug. 23, 1960

J. M. EASTERLING

2,949,696

TOY

Filed May 21, 1957

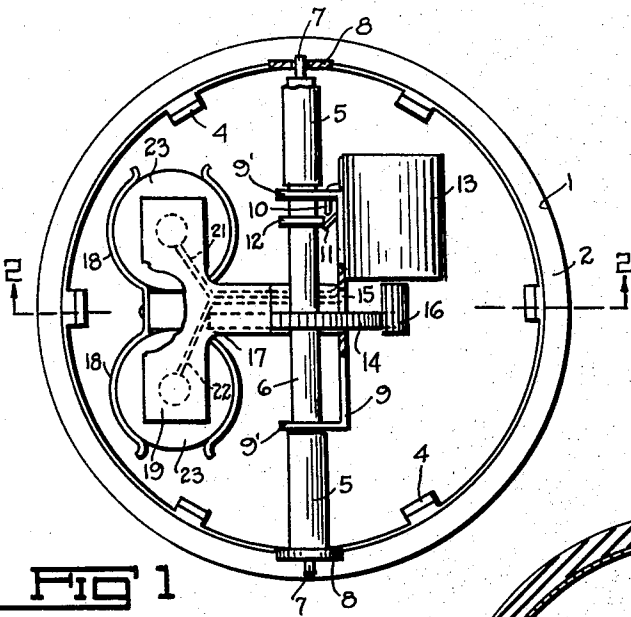


FIG 1

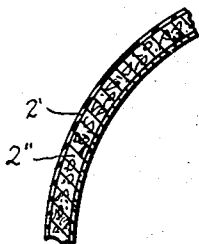


FIG 3

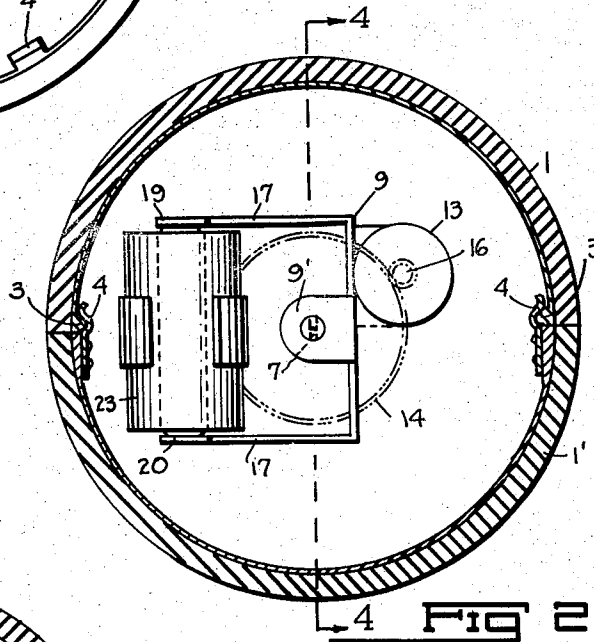


FIG 2

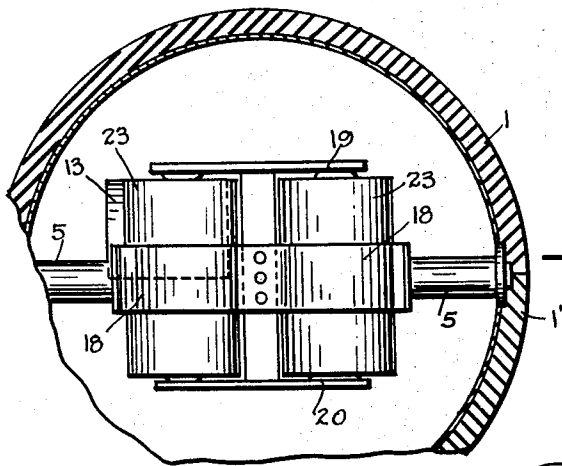


FIG 4

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1

2,949,696

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8 Claims. (Cl. 46-243)

This invention relates in general to toys and in particular to a battery propelled motorized ball which will propel itself and reverse direction when stopped by an obstruction.

Insofar as I am aware the prior art does not show a ball using a battery powered motor with the battery and motor so arranged within the ball as to cause the over-balancing weight thereof to make the ball roll, providing an amusing and mystifying toy for youngsters.

It is therefore one object of my invention to provide a ball or spherical toy in which a motor and batteries therefor are eccentrically mounted about a central shaft, the motor being geared to the shaft to move the ball as the motor and batteries revolve about the shaft.

It is another object of my invention to provide a switching mechanism within the ball operable from the exterior thereof to turn the battery powered motor on and off.

One more object of my invention is to provide a powered toy ball which, when it comes in contact with an object too large to go over, will reverse its direction of movement and continue to so do for hours.

And another object of the invention is to provide a simple, relatively inexpensive motorized toy which can be economically made and sold and which will keep children amused for hours.

Another object of my invention is to provide a modified form employing a transparent outer shell with colored material between it and the inner sphere whereby a changing pattern is provided as the sphere rotates.

Other objects and advantages as well as the construction and use of my invention will be apparent by reference to the following description in connection with the accompanying drawing in which:

Fig. 1 is a cross sectional view through the ball constructed in accordance with my invention, parts being shown in elevation.

Fig. 2 is a view on the line 2-2 of Fig. 1, the parts within the ball being shown in elevation.

Fig. 3 is a fragmentary, cross sectional view through a modified form of sphere used in my invention.

Fig. 4 is a vertical section on the line 4-4 of Fig. 2 with parts being shown in elevation.

Referring now to the drawing by numerals of reference, 1 and 1' designate two halves of a ball made of plastic or the like and which may have an external soft coating 2 of soft plastic material or rubber or the like. One half of the ball has an internal annular rib 3 and the other half of the ball is provided with spaced spring clips 4 which are adapted to snap over the rib 3 to hold the two halves of the ball together.

One half of the ball has oppositely disposed aligning sleeves 5 adapted to slidably support shaft 6 which is prevented from turning in the sleeves by flattened ends 7 engaging matching apertures in the ends of the sleeves. The ends of the shaft 6 may be embedded in the soft coating 2 and the locations suitably marked for actua-

2

tion of the shaft as a switch as will be hereinafter explained. The sleeves 5 may be reinforced at the ends with washers or flanges 8.

It will be noted that the sleeves 5 extend a substantial distance into the ball and act as side stops for a frame 9 having ears 9' rotatably mounted on the shaft 6. The frame 9 may be made of a rigid plastic or other material with nonconductive characteristics, a pair of contacts 10 and 11 being carried by the frame, a washer 12 on the shaft 6 being adapted to engage the contacts 10 and 11 to close a circuit for actuation of motor 13 which is mounted on frame 9. The circuit is closed and opened by the endwise movement of the shaft 6 which is actuated by depressing the soft coating 2 in the vicinity of the ends of the shaft.

A gear 14 is carried by shaft 6 and passes through aperture 15 in the frame 9 to engage elongated pinion 16 on the motor shaft. By using the elongated pinion the gear 14 will always remain in mesh therewith during endwise movement of the shaft 6.

The frame 9 has a transverse extension 17 terminating in battery holding clips 18 and terminal contact plates 19 and 20, suitable conductors 21 and 22 being carried or embedded in the frame, extension, and contact plates to form the necessary circuit through the contacts 10 and 11, batteries 23, and motor 13.

The batteries and motor are eccentrically positioned with respect to the central shaft 6, the batteries being greater in weight than the motor. Consequently, the overbalancing weight of the batteries will tend to keep the ball rolling in one direction and as the motor continues its operation, it and the batteries will revolve about the central shaft 6 maintaining the batteries in an off balance condition to keep the ball in motion. When the ball strikes an object or wall and is stopped thereby, after a short interval when the motor has moved the batteries again to overbalance the inertia of the ball it will roll in the opposite direction. This action will be maintained until the switch is turned off or the battery is exhausted.

With the motor offset in respect to a plane passing between the two batteries, the movement of the ball, upon reversal, may not always be 180° but may be in an irregular path which will lend interest in the operation of the toy.

In a modified form of my invention the outer shell may be formed with a spaced transparent wall 2' of a pliable material and a loose filler of vari-colored particles 2'' which, when the sphere rotates, will present an everchanging pattern of colors and designs, enhancing the entertaining properties of the toy.

From the foregoing it will be apparent that I have provided a new and novel toy in the form of a battery powered ball, which may be turned on and off externally, and which, by virtue of the eccentric positioning of internal components can be made to roll in an irregular pattern and reversing direction when blocked by an obstacle.

Obviously, changes in form, proportion and details of construction may be resorted to without departing from the spirit of my invention and I reserve all rights to such changes as come within the scope of these specifications and the claims which follow.

What I claim as new and desire to secure by Letters Patent is:

1. In a battery powered toy, a sphere comprising two separable sections, an axially slidable shaft extending within and across said sphere, a gear secured to the shaft, a frame carried by the shaft and rotatable thereabout, a motor carried by the frame, batteries carried by the frame in eccentric relation to the shaft, a pinion driven

2,949,696

3

by the motor, said pinion engaging the gear to rotate the frame, motor and batteries about the longitudinal axis of the shaft, imparting rolling movement to the sphere and switch means carried within said frame for electrically connecting said batteries and motor, said switch means being in position for switching operation in response to axial movement of said shaft to thereby control operation of said motor.

2. In a battery powered toy, a sphere comprising two separable sections, a shaft endwise slidable in one of the sections and nonrotatably carried thereby, a gear secured to the shaft, a frame carried by the shaft and rotatable thereabout, a motor carried by the frame, batteries carried by the frame in eccentric relation to the shaft, a pair of contacts carried within said sphere and respectively connected to said batteries and said motor, said contacts being positioned for actuation by endwise movement of the shaft to energize or deenergize the motor, a pinion driven by the motor, said pinion engaging the gear to rotate the frame, motor and batteries about the longitudinal axis of the shaft, imparting rolling movement to the sphere.

3. In a battery powered toy, a sphere comprising two separable sections, a shaft endwise slidable in one of the sections and nonrotatably carried thereby, a gear secured to the shaft, a frame carried by the shaft and rotatable thereabout, a motor carried by the frame, batteries carried by the frame in eccentric relation to the shaft, a pair of contacts carried by the frame, one of said contacts being connected to said batteries and the other of said contacts being connected to said motor, a contact actuating member carried by the shaft in position for operating engagement with said contacts in response to endwise sliding movement of said shaft to thereby control operation of said motor and a pinion driven by the motor and engaging the gear to rotate the frame, motor and batteries about the longitudinal axis of the shaft, imparting rolling movement to the sphere.

4. In a battery powered toy, a sphere comprising two separable sections, oppositely disposed aligning sleeves in one of the sections in spaced relation to each other, a shaft endwise slidable in the sleeves, means for preventing rotative movement of the shaft in relation to the sleeves, a gear fixed to the shaft, a frame in the sphere rotatable about the longitudinal axis of the shaft, a motor carried by the frame, batteries carried by the frame in eccentric relation to the shaft, a pair of contacts carried by said frame, one of said contacts being connected to said motor and the other of said contacts being connected to said batteries, means carried by said shaft for operably engaging said contacts in response to endwise movement of said shaft to thereby control operation of said motor, and a pinion driven by the mo-

4

tor, said pinion engaging the gear to impart a rotating motion to the frame, motor and batteries about the longitudinal axis of the shaft to impart rolling movement to the sphere.

5. The structure as specified in claim 4, including an outer covering on the sphere of a resilient material, the ends of the shaft being concealed by the covering, and external indicator means marking the position of the ends of the shaft.

6. The structure as specified in claim 1, including an internal annular rib about the peripheral edge of one of the sections, and a plurality of resilient clips extending from the other section adapted to engage the rib for removable retention of the two sections in assembled relation.

7. In a battery powered toy, a sphere comprising two separable sections, oppositely disposed aligning sleeves in one of the sections in spaced relation to each other, a shaft endwise slidable in the sleeves, means for preventing rotative movement of the shaft in relation to the sleeves, a gear fixed to the shaft, a frame in the sphere rotatable about the longitudinal axis of the shaft, a motor carried by the frame, batteries carried by the frame in eccentric relation to the shaft, a pair of contacts carried by said frame, one of said contacts being connected to said motor and the other of said contacts being connected to said batteries, means carried by said shaft for operably engaging said contacts in response to endwise movement of said shaft to thereby control operation of said motor, and an elongated pinion driven by the motor, said pinion engaging the gear during sliding movement thereof with the shaft to impart a rotating motion to the frame, motor and batteries about the longitudinal axis of the shaft to impart rolling movement to the sphere.

8. The structure as specified in claim 4, including an outer transparent covering spaced from the sphere, and colored material of changing pattern characteristics between the outer transparent covering and the sphere to provide constantly changing designs as the sphere is rotated.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,949,696

August 23, 1960

James M. Easterling

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 4, for "frame" read -- sphere --.

Signed and sealed this 4th day of April 1961.

(SEAL)

Attest: ERNEST W. SWIDER

~~XXXXXXXXXX~~

Attesting Officer

ARTHUR W. CROCKER
Acting Commissioner of Patents